

IN THE CLAIMS:

Cancel Claims 1 to 7.

Add claims 8 to 14 as follows:

8. (New) A process for monitoring the function of a NO_x sensor arranged in an exhaust duct of an internal combustion engine downstream from a NO_x storage catalyst, comprising:

(a) monitoring and accumulating NO_x levels detected by said sensor during a diagnostic period;

(b) determining a mass of absorbed NO_x by said NO_x storage catalyst as a difference between engine NO_x emissions and said accumulated NO_x levels detected by said sensor;

(c) calculating a target mass of absorbed NO_x from a model of said NO_x storage catalyst; and

(d) determining a mass ratio of said absorbed NO_x mass to said target NO_x mass and comparing said mass ratio with at least one of a lower bound and an upper bound.

9. (New) A process according to claim 8, further comprising comparing said mass ratio to both said lower bound and said upper bound and generating a maintenance signal when said mass ratio is below said lower bound and generating a maintenance signal when said mass ratio is above said upper bound.

10. (New) A process according to claim 8, wherein said diagnostic period begins immediately after a complete NOx regeneration of said NOx storage catalyst and a return to a lean mode of operation of said internal combustion engine.

11. (New) A process according to claim 10, wherein said diagnostic period ends after identification of a need for regeneration of said NOx storage catalyst.

12. (New) A process for monitoring the function of a NOx sensor arranged in an exhaust duct of an internal combustion engine downstream from a NOx storage catalyst which comprises:

(a) determining a duration time for a NOx regeneration of said NOx storage catalyst;

(b) calculating a target duration time for said NOx regeneration using a model of said NOx storage catalyst and NOx loading; and

(c) determining a time ratio of said duration time to said target duration time and comparing said time ratio with one of a lower bound and an upper bound.

13. (New) A process according to claim 12, further comprising comparing said time ratio to both said lower bound and said upper bound and generating a maintenance signal when said time ratio is below said lower bound and generating a maintenance signal when said time ratio is above said upper bound.

14. (New) A process according to any of the preceding claims, wherein said monitoring the function of said NOx sensor takes place only during a selected period of lean operation of said internal combustion engine.